Section 6.1

Example Suppose that the weight of adult males is normally distributed with a mean of 150 pounds and a standard deviation of 10 pounds.

1. How many standard deviations above the mean is 170 pounds?

2. How many standard deviations below the mean is 132 pounds?

3. What weight is 2.3 standard deviations above the mean?

Example Nigel scored 650 on the math portion of the SAT. Assume the math portion of the SAT is normally distributed with a mean of 500 and a standard deviation of 100. Victor scored 32 on the math portion of the ACT. Assume that the math portion of the ACT is normally distributed with a mean of 24 and a standard deviation of 4. Relatively speaking, which student did better?

Example Suppose scores on a college entrance exam are normally distributed with a mean of 500 and a standard deviation of 100.

1. What percentage of students scored at least 500?

2. What percentage of students scored between 400 and 600?

3. If a student needed to get in at least the 97.5^{th} percentile (approximately) to get into this college, what score would the student need to get on the exam in order to be accepted?

Section 6.2

Example Use your calculator to compute the following. Draw a sketch to illustrate the desired areas.

1. Find $P(z > 0)$.

2. Find $P(z > -1.23)$.

3. Find $P(2.10 < z < 3.45)$.

4. Find $P(z < 6.09)$.

5. Find $P(z > 1.00)$.

6. Find $P(z > 4.00)$.

Example IQ scores are normally distributed with a mean of 100 and a standard deviation of 16.

1. What percent of people have an IQ above 120?

2. What percent of people have an IQ less than 60?

3. Suppose that a person has an IQ of 150. Would this be considered unusual?

4. Suppose that in order to join a special club a person's IQ must be in at least the 97th percentile. What is the cut-off IQ needed in order to join this club?

Example Consumer Reports indicated that the average life of a refrigerator before replacement is 14 years. Suppose that it is also known that the life of a refrigerator is normally distributed and that 95% of all refrigerators are replaced between 9 and 19 years.

1. Estimate σ.

2. What is the probability that a person will keep a refrigerator between 10 years and 15 years before replacement?

3. What is the probability that a person will keep a refrigerator more than 20 years before replacement?

Example Suppose that the finish times for the 100 meter dash for 6th grade girls at Oak Tree School are normally distributed with a mean of 18.2 seconds and a standard deviation of 1.1 seconds. The fastest 10% of girls are going to get an award. What finish times qualify a girl to get an award?

Example Find the z-score such that 3% of the area under the standard normal curve lies to the left of z.

Example Find the z-score such that 2% of the area under the standard normal curve lies to the right of z.

Example Find the value of A score such that 60% of the normal curve lies between $-A$ and A.

Example Find the value of A score such that 25% of the normal curve lies between $-A$ and A.